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THE
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☞See advertisement on last page.

Poetry.

THOUGHTS.

They come when the sunset,
Is bright on the mountain;
They come when the moonlight
Is clear on the fountain,
At morn and at even,
By minutes and hours,
They come from the forest,
From birds and from flowers.

They come when some token,
Of days past will rise,
As a link to the present,
And then they bring sighs;
They come when some vision
Of hope and of fears
Rushes on to the future,
And then they bring tears.

They come when the sea-mist,
O'er ocean is rife,
And tell of the shadows
That hang o'er our life;
They come when the tempest
Its thunder and gloom,
Spreads round, and they speak
Of the earth and the tomb.

They come when the ripple,
Is low on the lake:
And the plover is nestling
By fountain and brake,—
And the twilight looks out,
With gems on its breast,
And they whisper that all,
Save themselves are at rest.

They come when the light wind
Is fanning the leaves,
They come when the flower cup
The dew drop receives—
By night's noontide silence,
By day's noontide hum,
At all times, oh deeply
And darkly they come.

THE BLIND GIRL'S SONG.

BY "HENRY."

Oh! tell me not of happy hours,
Of sunlit days or birds or flowers,
Or aught that's bright;
For to my love and darksome soul,
All—*all* is night!

Ye say the sun still brightly shines,
And gaily wave the trellis vines,
In his bright glance,
And still upon the sparkling sea,
The waters dance.

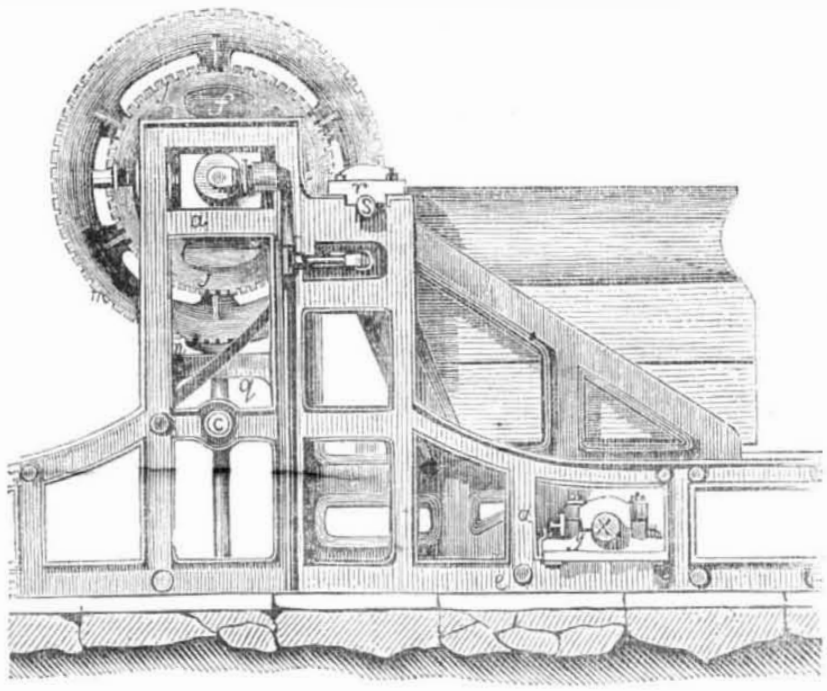
And yet the feathered warblers sing,
As poised upon their ambient wing
They cleave the sky,—
And swift they skim the mirror'd lake
Or soar on high.

I know it for I *feel* it all;
But o'er my sight is cast a pall,
So dark and dread,
That oft my rebel heart would wish
That I were dead!

The average number of deaths in the City of New York, is 50 per day.

MACHINE FOR GLASS MOULDING.

Figure 1.



This is an invention of Mr. Henry Bessemer, of Baxter House, in the county of Middlesex, England, and relates to apparatus for founding and casting plate glass, a subject which must commend itself to many in our country, as this art is but young even in England and scarcely known here, but which must yet be extensively manufactured, as the means are not wanting, and the material is abundant in many of our States. At present our valuable plates are imported and Germans are the artisans that are mostly employed in England. There are plenty of them in this country and doubtless many good artisans capable of managing this business, without sending thousands of miles to purchase it at a vast expense.

In this improvement peculiar melting pots are used. This carriage in the figure consists of a strong ribbed iron frame mounted on four small flanged wheels which run on two rails. The upper side has a recess into which blocks of *soap stone* or fire brick are fitted into an iron frame. In the upper part of these blocks recesses are made for the melting pots to sit snugly and a quantity of broken bottle glass is laid on the top of the blocks and they are heated till the glass melts and cements the joints of the blocks together, and while this glass is yet in a fluid state, the carriage is removed a moment from the furnace to receive the melting pot which is brought in a white heat from the pot arch, set in the midst of the fluid glass, and the carriage then returned to the furnace. On afterwards using the pot, as the bottom is very thick and the heat only having access to it through the materials which it may contain, the bottle glass used to cement the pot to the bed or recess is found not to be too cold to be brittle, nor so hot as to allow the pot to slip from the carriage.

Figure 1, is a side elevation of the machine with the pot and carriage in their position after being removed from the furnace. (The other figures are placed on page 236, to which the reader is referred in connection with this, as the description necessarily occupies considerable space.)

Figure 2, is a longitudinal section shewing the pot in an elevated position and partly emptied. Figure 3, is a longitudinal section of one of the rollers and stuffing boxes shewing how the water is made to enter and leave while they are in motion. The same letters indicate like parts on all the figures. *a a*, is a side framing of cast iron secured by the cross pieces *c*, and also by the stretchers *e e*, between the side frames *a a*. The rollers *f* and *g*, are placed in suitable bearings fitted to the side frames, and are made to move to and from each other by means of screws, which force the brasses H, and roller *f*, near to the roller *g*. A piece of iron is placed between the brasses and the frame, and according as it is exchanged for one more or less thickness so will it cause the rollers to be nearer or further apart, and thus regulate the thickness of the glass. The roller *f*, is also provided with wheels *j j*, at each end, and the roller *g*, also with wheels at each end within the side framing. In addi-

[*Continued on page* 236.

Remarkable Operation.

The Charleston Courier says "we have lately been permitted to see three casts of the nose and face of a young gentleman of this city who labored under a great natural deformity of the nose—what is vulgarly called the bridge being very much depressed whilst the point was turned up. To relieve this deformity, Dr. N. D'Alvigny, dentist, invented an instrument not thicker than a good sized needle flattened, and with cutting edges at the point which made an incision so small, that since the healing of the wound it can scarcely be perceived—and yet, with this needle, the cartilages which connect the *ossa nasi* and the *nasal processes* of the *superior maxillary* bones were divided, and an apparatus steadily supplied upon the bridge of the nose so as by constant pressure to keep the parts in a correct position, until the parts become permanently united. The nose by this means has been restored to a natural and comely shape."

Salt a good Manure for Celery.

A root and stalk of celery weighing fourteen pounds without the leaves, and measuring fourteen inches in circumference, was exhibited at a recent meeting of the Cincinnatti Horticultural Society. It was exhibited to show the value of salt as a manure for this plant, the gentleman who raised the article having made the experiment of treating a portion of his plants in the ordinary way, and manuring a part of them with salt. The former were of ordinary size and quality, the latter being both larger and of finer flavor, of which the specimen exhibited was an exemplification.

RAIL ROAD NEWS.

Tunnel through the Green Mountains.

There is at present a projected line of railroad from Boston via Greenfield, Mass., to Troy, N. Y., which if executed will be the greatest work ever accomplished. The road will have to pass through the Hoosick Mountain, about 2000 feet in height, and the length of the tunnel will be about four miles and a half. It is calculated that from the few hands that could be employed to tunnel, it would take five years to accomplish the subterranean excavation, and that from one to two millions of dollars would be the required cost. It is proposed to sink four or five shafts down through the mountain and cut out in different directions The work can be done, but the profits will never be able to balance the expense in the opinion of many.

Railroads in the West.

The Cincinnati Chronicle states that the entire line of the Mad River Railroad is expected to be completed by the 1st of May next, and that then the summer trip between the cities of Cincinnatti and New York may be made in *three days*, and all by steam. The programmes of the Railroad Companies, it is expected, will be as follows:—

Leave Cincinnati at 2 P. M.; and arrive at Springfield to sup, at 7 P. M.

Leave Springfield at 9 P. M.; arrive at Sandusky, to breakfast, at 6 A. M.

Leave Sandusky at 7 A. M.; arrive at Buffalo next day, to breakfast, at 5 A. M.

Leave Buffalo at 6 A. M.; arrive at Albany, to breakfast, at 4 A. M.

Leave Albany at 6 A. M; and arrive at New York at 3 P. M

Reduction of Railroad Fare.

The Bill reducing the Fare on Rail Roads between Albany and Buffalo, which passed the Assembly, was rejected in the Senate by a vote of 22 to 4.

Pennsylvania Railroad.

A Bill has passed the Pennsylvania Legislature, authorizing the corporation of Philadelphia and Alleghany Counties to subscribe stock for a connection with the Portage Railroad.

Magnetic Telegraph.

F. Rice, of Burlington, Vermont, has obtained the right to use Morse's Electro Magnetic Telegraph for a line of Telegraphic communication between the city of Boston and the village of Burlington, Vermont, passing through Lowell, Nashua, Manchester, Concord, Franklin, Lebanon, White River, Windsor, Woodstock, Randolph, Northfield, Montpelier, Waterbury, and such other villages as he may judge best, with the right to connect with the Troy and Canada Junction Telegraph Line at the said village of Burlington.

Articles of association are now published for a company to be called the Boston and Burlington Telegraph Company. The capital stock is to be equal to the cost of the line, estimating $200 per mile for the first wire, and additional $100 for the second wire, $3,000 for the accommodation of business and expense of superintendance. The stock is divided into shares of $50 each

Telegraph Knocked Down.

There are towers built on the banks of the Hudson a short distance above this city, for suspending the wires of House's Telegraph, which crosses the river to the Jersey side.—Last week the fly of a sloop caught the curves of the wires and tore them away.

Our Telegraph operators will yet be forced into the more plausible plan of carrying the wires across rivers by tubes laid down in the water, and the plan of producing such tubes as described in the last number of the Scientific American, will no doubt answer a good purpose.

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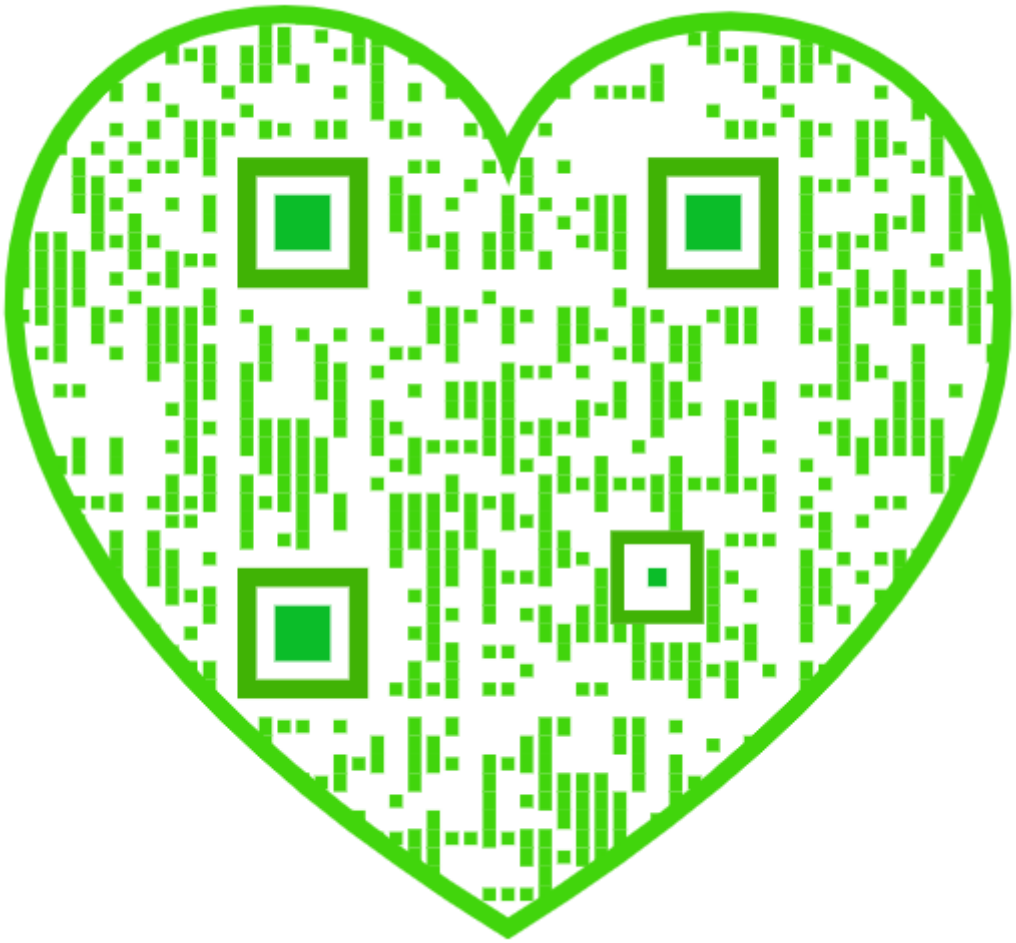

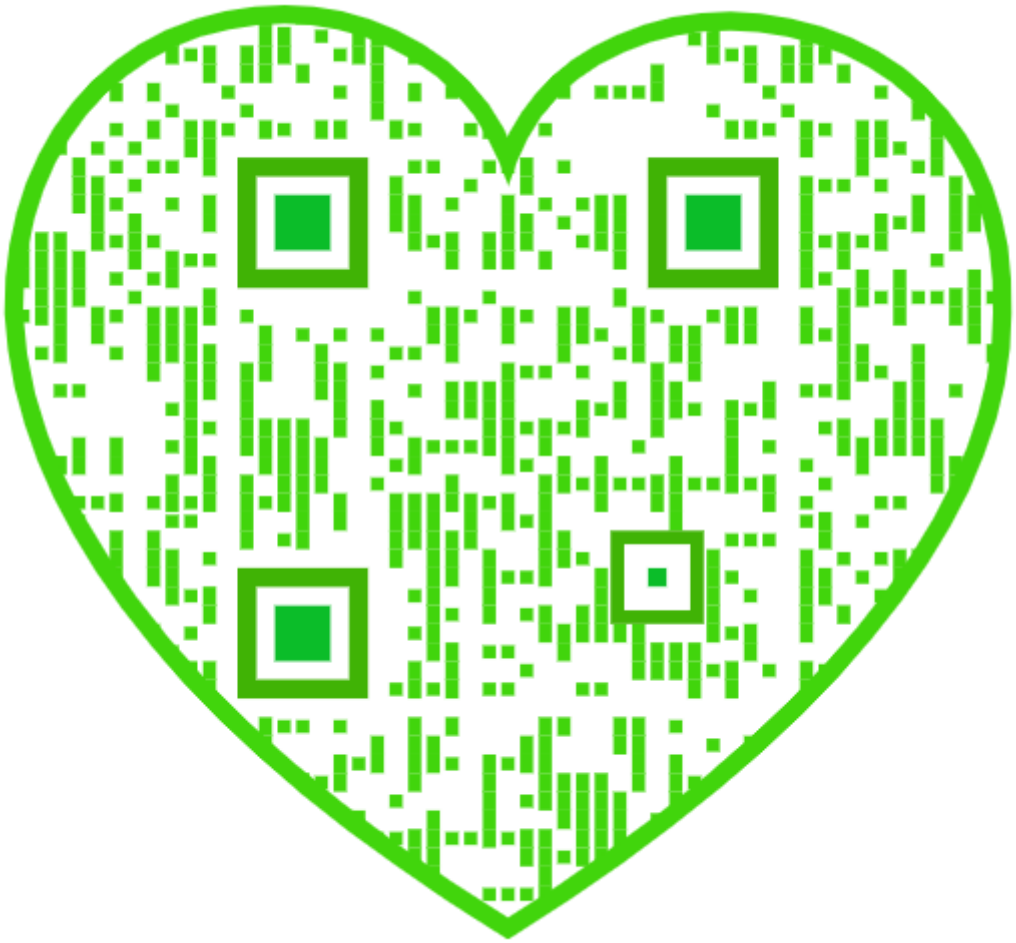

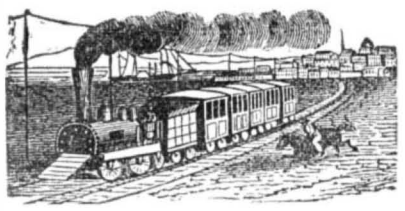

Extraordinary Occurrence.

During the period when the water was so low at Niagara Falls, the Table Rock was left so dry as to enable those who had the good fortune to be in the vicinity to go as far across the river above, as to be directly over the Termination Rock. This feat was accomplished, among others, by ladies.

The villagers of Chippawa, thought they had entirely lost their creek. Off the old Chippewa Fort, about 100 feet below water mark, was discovered a burning spring in the bed of the Niagara River, which some had the curiosity to enclose with an old potash kettle and gun barrel knitted therein, and succeeded in producing flame and an explosion. Several bayonets, muskets, swords, &c., have been picked up.

Easy way to Measure the Quantity of Oxygen in the Atmosphere.

Procure a glass tube about 12 or 15 inches long and half an inch in diameter open at one end and divided into a hundred equal parts.—Take then a small piece of phosphorus and put it on a piece of wood a little less in diameter than the tube and put this piece of wood or stick into a vessel of water and set fire to it, then cover the phosphorus with your tube so that the tube shall sit on the water without letting the atmosphere into it. When the combustion of the phosphorus ceases the water will have risen in the tube and will occupy the place of the oxygen consumed in combustion, and the division to which the water has reached will shew the number of parts of it in 100 parts of atmospheric air. This is not the most perfect method of testing the quantity of oxygen in the atmosphere, but it affords a pretty correct idea of it. The proportion of oxygen in the atmosphere is 21, nitrogen 79.

Phosphorescent Bodies.

Many bodies are phosphorescent, that is to say omit light, after they have been exposed to the sun or any shining source. Thus, oyster shells, which have been calcined with sulphur, shine in a dark place, after they have been exposed to the light, and certain diamonds do the same. So, too, during the process of slow decay light is very often emitted, as when wood is mouldering, or meat is becoming putrescent. The source of the luminousness in these cases seems to be the same as in ordinary combustion, that is, the burning away of carbon and hydrogen, under the influence of atmospheric air: but, in certain cases, the functions of life give rise to an abundant emission of light, as in fireflies and glow-worms, and there is reason to believe that the phenomenon is to a great extent subject to the volition of the animal.

Genial is the Soil of Sorrow.

Genial, almost to a miracle, is the soil of sorrow, wherein the smallest seed of love, timely falling, becometh a tree, in whose foliage, the birds of blessed song lodge, and sing unceasingly. And *the doubts of God's goodness, whence are they ?* Rarely from the weary and burdened—from those broken in the practical service of grief and toil; but from the theoretic students at ease in their closets of meditation, treated themselves, most gently by the legislation of that universe which they criticise with a melancholy so profound.

A Splendid Steamboat.

A steamboat named the Sultana, was lately launched at Cincinnati, which is stated to be the largest that ever floated on the Western waters Her extreme length is 306 feet; extreme breadth 80 feet; 9 feet hold; 2 engines 10 feet stroke, 30 inch cylinder; 6 boilers; 1 engine expressly for lifting freight; and one doctor, or supply engine, with all the late improvements, driving three large bilge pumps, and in case of fire working two engines: she will carry 1800 tons.

New Balloon Ship.

Mr. M. Von Ruyter, a Dutch engineer, has invented a new Aeronuatic Ship which rises into the air from the impetus of its own working, with a weight of 200,000 pounds, with immense rapidity, and can be steered at will. Mr. Von Ruyter resides in Rotterdam, and exhibited a short time ago a working model 1 ell 27 inches in breadth and 83 ells 14 inches in length.

The above is from the London Mining Journal, and it may be that the Dutch papers want to frighten uncle John, like Napoleon did during the period that he threatened to invade him not only by his Bologne fleet but by his balloons. Holland, however, has always been famous for flying. We find as far back as 1673, the *Mercure Hollandois de l'an* describing an affair that occurred at Ratisbone. Charles Bernoven, surgeon, a celebrated flyer, flew from the top of a tower and lost his life. We prefer "flights of fancy" to all æronautic flights whatever.

A Venerable and Valuable Present.

Mr. Custis, of Arlington, has presented to his son-in-law, Capt. R. E. Lee, of the U. S. Engineers, (an officer whose brilliant services in the Mexican war have elicited the praise of all the Generals,) a sword with the following inscriptions. "The gift of General Washington, to George W. P. Custis; 10th of January, 1799. Presented by George W. P. Custis, to Capt. R. E. Lee, U. S. A., the 22d., of February, 1848,"

This old sabre is peculiarly valuable from its being the only sword that Washington ever presented in his life-time, and with his own hand, to a human being.

When presented by the Chief to his adopted son, (then an officer of cavalry,) in 1799, it was attended with this injunction. "This sword, sir, you are never to draw, but in a just cause, or in defence of your country."

Curious Manuscript of the Hebrew Bible.

There is in the royal library, a curious manuscript, containing the whole Hebrew bible, which belonged to a synagogue in Jerusalem. A very celebrated Rabbi, who was born in Spain, in the year 1194, built a synagogue in Jerusalem, and in that synagogue, was preserved with the utmost veneration till that city was taken by the Emperor Solim in 1517. The manuscript was then seized by a Turkish officer, who carried it to Aleppo, where, in 1683, it came into the hands of the celebrated D'Arvieux, and it was afterwards purchased by an English gentleman, who brought it home to enrich his own country. In this manuscript the Psalms and Proverbs are written in hemistiches, as Hebrew poetry should be. Though it has suffered by erasures, it has still many various readings, and several of consequence; in particular it has two verses in one place which are clearly genuine, though the Masorah has pronounced them spurious.

Mahomedanism and Literature.

The first newspaper in all the Turkish dominions was started by an American Missionary some 17 years since, and printed in the English language, for foreign residents, who explained it to others, and thus afforded a sample to the Government and nation. The only newspaper now printed in the Turkish language was originated and is conducted chiefly by an Englishman.

There are no newspapers in Syria or Persia, and in Egypt, the Barbary States, and other countries including 40,000,000 speaking the Arabic language, there is but one newspaper in the native tongue, and but three or four in the French or English, showing that there is nothing in Mahomedanism favorable to general improvement.

Honey Moon.

The word honeymoon is derived from an ancient Teutonic custom, of drinking metheglen at marriages. It was a drink made of honey, and flavored with mulberries.—Amongst the Teutonic nobility, the marriage festival lasted a lunar month, during which time this drink was well supplied and hence the festival received the name of *honah moon* Alaric the Goth is said to have died on his wedding night from a too great indulgence in metheglen.

Steamboat Explosions.

The Cincinnatti Commercial publishes a communication from Capt. Haldeman, the popular commander of the steamboat Yorktown on the subject of explosions on board of steam boats, containing some interesting and instructive statements. The Captain bears strong testimony to the efficacy of Evans' Patent Safety Guard in preventing explosions. He says, that during the eight years the Safety Guard has been in use, it has been in operation upon some one hundred and twenty-five steamboats, and out of that number only two collapsed their flues, which was caused by the lever being fastened down in such a way as to prevent it from going into operation, thereby cheating the object of its invention Further, the Captain says: "I am certain that it is the most valuable invention that has ever yet been invented to prevent explosions and one that can be relied on, and no high pressure steamboat ought to be without them." And again, he says: "So sure and so confident am I of the safety of this invention from explosion, that I would be perfectly willing to stand over a set of boilers, and defy the artifice of man, or the ingenuity of the world to blow them up, if they were well supplied with Evans' Safety Guard."

An Indian Cairn.

On the road to Oregon about one hundred miles west of Fort Laramie there is a pile of stones about 200 feet high, and three hundred feet in circumference at the base. The stones vary in size from the size of ones thumb to that of a water pail, all placed as regular as masonry. This could not have been a freak of nature They must have been piled up by men to commemorate some great event—but by whom and for what purpose who can tell?—A short distance from this pile are two large rocks about twenty feet apart and 50 feet high. The opposing surfaces show that they were once united, but thrown apart from some convulsion of nature.

Independence Rock, on the same route is an immense pile, covering 20 acres of ground and is 3000 feet high. On one side it is broken and falls off. From the top you can see hundreds of miles.

On the side of this rock next the road are ten thousand names of men or emigrants who were going to Oregon.

In the top of it is a large hole or reservoir. that will hold six or eight barrels of water. There are also holes in the side that form complete rooms. On the walls of these rooms are written a great many names. At the foot of the rock runs the Sweet Water river a beautiful clear stream.

How to Clothe.

Persons are apt to have quite too much clothing. Lord Bacon says, "A great store of clothes, either upon the bed or the back, relaxes the body; and many have discovered, by sad experience, that it has drained the purse. It is one of the evils of civilization, that not only luxuries in eating and drinking are required, but also a superabundance of clothing; and that too, generally, of an expensive kind. Its abundance renders people less hardy snd more liable to disease. Infants who take no exercise, require to be clad more than children who can run about in the open air. It is ludicrous to see children from eight to a dozen years of age, rigged out with woolen shirts, drawers, thick stockings, and boots, fur caps, over coats, mittens, comforters, muffs, and tippets, and the whole paraphernalia which characterizes one of our city urchins. Better, far better, would it be to begin life with the lightest clothing. Then would thicker clothes be more useful in old age.

The Player and the Preacher

Garrick being once in Dr. Stenhouse's library, asked him:—'What books he had on the desk before him?'—*Only* the Bible and Prayer-book.' '*Only* the Bible and Prayer-book,' replied the player, 'why, you tossed them backwards, and turned the leaves as carelessly, as if they were those of a day-book and ledger.' The Doctor was wise enough to see the force of these observations, and ever after avoided the faults they were designed to reprove."

Southern Coal.

The Mobile Tribune says, a letter has been received from Capt. Liot, of the West India steamer Dee, dated at Havanna, giving a very favorable account of the Tuscaloosa coal which was taken on board at Cat Island for experiment. He states that the coal is 4 per cent better than any yet used on the steamers of that line. This fact, the Tribune says, will doubtless lead speedily to extensive operations for keeping a supply of coal at Mobile.

Winter Killed Wheat.

A correspondent of the Ohio Cultivator says that his late sown wheat on corn ground was much "winter killed," that is, thrown out by frost which he chiefly remedied by using a heavy roller pressing the half-killed roots with the ground which caused them to vegetate. Such wheat yielded about twenty bushels per acre.

Independence Bell.

The old State House bell, which rung out in merry peals when the declaration of independence was announced, and which was accidentally cracked about three years ago in an attempt to ring it, is to be deposited in the hall of Independence in Philadelphia. It will be placed upon a suitable pedestal, under a glass case, and will remain a permanent fixture of the venerated room.

A Prophecy.

A celebrated rock in Ireland, known as the rock of Cashel, recently fell to the ground, after defying the storms that have beat upon it since the deluge. An ancient prophecy was connected with this rock, the substance of which was, that a great revolution would occur in England the same year the rock should fall.

A Matrimonial Courtesy.

Friend Grace, it seems had a very fine horse and a very poor one. When seen riding the latter he was asked the reason; it turned out that his better half had taken the good one. 'What!' said the bantering bachelor, 'how comes it you let your mistress ride the better horse?' The only reply was, 'Friend when thou be'est married, thou'lt know.'

New Mode of Navigation.

The Milwaukie (Wisconsin) Sentinel, of the 17th inst., has the following:—A Prairie schooner loaded with forty barrels of flour, drawn by six horses, arrived in town yesterday, and went into store here.

It was said of the late Mr. Bell, of the Chancery Bar (England,) that he wrote three several hands, one of which no one could read but himself, another which his clerk could read and he could not: and another which nobody could read.

A colossal statue is preparing for erection at Haarlem, in honor of a citizen of that place, Laurent Kostar, to whom the Dutch ascribe the invention of printing.

A jury in Philadelphia has found a verdict of $1000 in favor of a young lady, for a breach of promise; and a jury in Mass., have given $1000 damages in favor of a gentleman at Bellow's Falls against a young lady, for a similar breach of contract.

Mr. Hotchkiss of Brooklyn, who was almost murdered by Baily has recovered, but has lost the power of speech and memory.

The Christian Citizen says that the nucleus of the Anti Corn Law League in England was composed of seven Scotchmen and one Irishman

An earthquake occurred lately in Mexico, and all the potatoes and pancakes were swallowed up in the market. The ninth regiment of Uncle Sam's Infantry were stationed close by.

The Troy and Burlington Telegraph line has been working for several days with a battery of ten cups and using spring water.

The Church of the Holy Trinity, recently erected at Brooklyn, N. Y., cost the modest sum of one hundred and fifty thousand dollars.

The oxide of tin has been discovered in New Jersey.

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For the Scientific American.

The American Rifle.

The great advantages possessed by American riflemen over those of other countries, consists in the use of the elongated ball, or slug, (termed by Chapman "the picket bullet,") over the round ball, and in adopting our rifles in every particular to this form of lead. The slug has been used, more or less, for many years, but with very little success previous to the invention of Clark's Loading Muzzle in 1840. The form of slugs used previous to this time were, however, faulty in a very important particular. They were of an egg or acorn shape. This form with the necessary amount of reaming at the muzzle of the rifle, to insure a safe and convenient entrance of the bullet in loading, resulted in destroying the perfection of delivery when the rifle was discharged, by liberating the bullet before it was entirely out of the barrel and while it was exposed to the blast from the charge of exploded powder, in which case the least imperfection in the muzzle, slug or patch would cause the slug to be turned from a direct line upon its own axis. Therefore the slug was generally condemned as being inferior to the ball for accuracy. With the invention of Clark's loading muzzle the form of slug was changed, making it more pointed, much increasing its proportionate length and making it nearly square behind. The advantages of this form of lead over the ball, will be readily appreciated by any one at all conversant in rifle projectiles. It possesses a form suitably adapted to pass through the air, or any material substance with the greatest possible ease. It removes no more air than the round ball which fits the same calibre, and its weight is four times greater. With this form of lead a perfect muzzle for loading and a perfect muzzle to fire from, cannot be possessed by one and the same thing. Hence the advantages of Clark's muzzle, which consists of a piece one inch in length of the original barrel being cut off and fitted with steady pins or any other arrangement which will insure a good fit and at the same time secure the coincidence between the line of calibre of the loading muzzle and the barrel. The muzzle piece being reamed at the top, or made tunnel shaped, with a proper starting tool, secures a perfect entrance of the slug without a liability of cutting or straining the patch, as the lead is gradually compressed to the form of calibre and at the same time sufficiently so as to fill deep rifling which secures its hold at the discharge. By taking the loading muzzle off, the barrel muzzle is left perfectly square, which on delivery of the slug holds it firmly in its position until it is entirely out of the barrel, when the explosive gas has free scope to liberate itself without exerting much influence on the slug. To insure steadiness to the rifle at the moment of discharge and under the action of a strong charge of powder, the American rifles are made much heavier in proportion to size of calibre than those of any other country. We use a large charge of mild powder and calculate on its burning the whole length of the barrel, for the greatest force of a charge of powder is exerted at the moment when the last kernel explodes, and by this arrangement we secure a moderate start of the slug at the breech and an increase in velocity up to the muzzle.—Another advantage consists in the increase twist of the rifles, by which we bring the slug to whatever motion is requisite on its own axis by a gradual increase from the breech to the muzzle. The advantages of substituting steel for iron in the construction of rifles must be too obvious to any one acquainted with the nature and qualities of the two metals to require an argument on that point.

The most famous manufacturer of rifles in the world is Mr. Edwin Wesson, now of Hartford, Conn, to which place he has lately removed his factory from Northboro, Mass. He was the first rifle maker who brought into successful practice *Clark's patent loading muzzle*. He enjoyed the exclusive right to this patent, but unlike many other owners of patents who are exclusives, he has generously allowed all rifle makers the use of it upon the payment of a very moderate compensation. Mr. Wesson was granted a patent last June for an improved rifle to do a great amount of work in a short space of time, a description of which we may give at some future period.

The Minuteness of Creation.

It is utterly impossible for the mind to conceive of the almost infinite minuteness of an atom. A single grain of gold, for instance, might be beaten out so as to cover a square foot of space, and yet we have not approached its reduction to atoms. An admirable illustration by Delper, he would give, as he had never seen it quoted: it was this. Reduce a cubic inch of sulphur to fine powder, and you may cover with it an area of six square miles. Take one grain of this powder an triturate it thoroughly with ninety-nine grains of sugar of milk, and its presence would be detectible in every grain of the hundred. Take a grain of this, and treat it in the same way with other ninety-nine grains of sugar of milk, and so on, At the third dilution as we may call it, the powder thus resulting from a cubic inch of sulphur would cover two square miles of area; at the fifth, the empire of ustria; at the sixth, the whole of Asia and Africa; at the ninth, it would cover the entire surface of the sun, with all its planets, and all their satelites. And yet, although in every grain of this powder the sulphur was found to be present, we had not reduced it to atoms. Again, it is well known that every drop of putrid water, under certain circumstances, contains millions of animalcules, invisible except to high powers of the microscope. And every one of these animalcules is a highly organized being, having at least something analagous to a skeleton,—capable of action—of pursuing, of retreating, of attack and of defence The globules of the blood of an elephant are perceivable only with a powerful microscope, and yet these animalcules must have blood, and that blood must consist of similar globules. Once more! The Bovista Gigantea, a species of mushroom, in the space of twelve hours shoots up from a scarcely perceptible germ to a plant a foot in diameter. Every square inch of its surface contains three hundred and thirty-six millions of cells, every cell, with their six sides is divided from those around it by filaments of far more complex structure than an atom af potash, and yet we have not got a glimpse even of the atoms of which they are composed He would confess, inquiries such as these inspired him with but one feeling—fear. It was as if he were taken, by some profound astronomer, far amongst the worlds that people infinite space, and he was ready to cry out for some one to lead him back to solid ground once more. One thing only gave him comfort: he knew of something higher, deeper than those facts—it was their idea. These were, after all, only the letters in which the infinite idea is blazoned. He felt as did the deep-thoughted Pascal, when he exclaimed, that although the universe were to crush him, he would still feel himself greater than the universe, for *he* knew *that and how* it was crushing him.—*Darwin's Lectures.*

Consumption and Ventilation.

Sir Jacob Starks, physician to the Queen of England, enumerates as the exciting cause of consumption, "long confinement in close ill-ventilated rooms, whether nurseries, or school-rooms, or manufactories;" he also says, "if an infant, born in perfect health, and of the healthiest parents, be kept in close rooms, in which free ventilation and cleanliness are neglected, a few months will often suffice to induce tubercelous chachexia"—the beginning of consumption.—Persons engaged in confined close rooms, or workshops are the chief sufferers from consumption; thus, of the 233 tailors who died in one district in London, in 1839, 123 died of diseases of the lungs, of whom ninety-two died of consumption. Of fifty-two milliners dying in the same year, thirty-three died of diseases of the lungs, of whom 28 died of consumption. Dr. Guy reports, that in a close printers' room, he found soventeen men at work, of whom three had spitting of blood, two had affections of the lungs, and five had constant and severe colds. After reading these sad facts, who can deny that the chief cause of consumption is the respiration of bad air?

Foreign Correspondence.

GLASGOW, March 13, 1848.

Dear Scientific:—It seems as if some great volcanic eruption had shook the powers of the European world, and from late accounts from the West and other quarters the preparations going on, seem to indicate coming anarchy and revolt. Revolution fell on the throne of France like a thunderbolt. Whatever may be the subsequent results, and future destiny of France, is only known to that Potentate "before whose eye a sparrow falls and worlds roll." Europe, Uuiversal Europe has felt the shock, Spain, Portugal, Rome, Sicily, the Germanic confederacy, the dispersed and scattered sons of Poland, have felt impulsed. The cry of liberty, and equal rights has sounded from Calais to Doer, the remote mountains of Wales, in England, of the Hebrides in Scotland, and the famine-stricken soil of Erin, has echoed back "liberty and the rights of the people." Our government has declared France as a Republic, this is policy, what else could be done, England is placed in difficulties out of which it will require more sage and judicious men to steer her, than the present ministry. Our British possessions in North America have once attempted to become independant. Our country has internal evils which has long kept us poor and trodden under, the greatest of which is our national debt. The working classes, the toil-worn and oppressed masses have again and again plead for the rights of labor, they have been crushed, but now the storm which swept over the throne of France has begun to rustle over England, like the breeze which precedes the wind of the wilderness. There are voices coming from the mountain fastness, from the glens, and hill steeps of Scotland where beneath the green turf rest the ashes of the patriots of other days. The people of England have met in thousands and tens of thousands and demanded—what? Bread and their rights. What would have been recognised as treason and a penal crime under the Castlereagh Ministry, is now placarded on our streets and City buildings. We have already had some terrible riots in our city, attended with loss of life and property—a mob of some thousands passed through our city, breaking, demolishing and stealing. The mob was more a disgrace to liberty and Glasgow than an honor. I would expect more good from our *tumults*, were they not *tumults*, but they met on sabbath day and profaned it—hence no good can come out of their meetings The most intelligent part of the people here are now condemning at least some of the conduct of the French populace. For example, the mob at Havre threatened to burn the flax mills unless the British workmen were dismissed. Many of the workmen were reduced to distress, not being able to draw their earnings.—600 or 700 persons discharged have been conveyed home at the expense of the English government. These were mostly Scotch, and their kinsmen the north of Irelanders. I have seen many of these operatives and knew them before they went to France. They are the very choicest of our linen dressers and were hired by French agents who came from France for that purpose. They were solicited to go there, and many of them have lost their all by doing so. As for the wealthy British who have been driven from France they deserve it. They are the people who drain England of money to spend abroad. Let them stay now at home.

The great evil with our Scotch people now is want of employment. The old parish employment system is abolished, much to the injury of our mechanics.

As it regards scientific information, it is almost drowned for a space amid popular commotion. Mr. Simpson, your acquaintance's fanning mill propellor is the only wonderment, and is a great walk-the-water novelty.

The first of the new line of steamers of the North America Royal Mail Packet Co. to sail between Liverpool and your city, has just left this port to sail for New York on the 15th of April. She is named the America, and is a splendid vessel She was built at Greenock, where Henry Eckford of New York served his apprenticeship, and when she arrives at New York, the daughter will no doubt welcome and praise the handiwork of the same mother in naval architecture. Her keel and fore rake are 250 feet, her breadth of beam 38 feet, tonnage 1800, and engines 650 horse power, built by Robert Napier, and built as he can build them. The America is to be commanded by Captain Judkins, the senior Captain of the company. She is superior to any vessel in her Majesty's service and can be converted into a war vessel in 48 hours. She is splendidly fitted up, but I need say no more, you will see for yourself. The whole of this new line are Clyde built and finished from kelson to topgallant by Scottish mechanics.—The America, Niagara and Canada were built by Mr. Steel of Greenock, the Europa by John Wood of Port Glasgow. Napier is the Engineer for all. There are but few of the ship carpenters of Greenock who cannot build a ship throughout. There is a fine Athenaum in that place, where they learn drawing and nautical architecture for a trifling outlay, and thither the young carpenters resort to converse, draw, and spend their evening hours.

Trade is reviving in our manufacturing districts and this is glad news to many poor people. 18,000 persons died in this place last winter from typhus fever and other causes.—No more outbreaks need be anticipated here. Ten thousand citizens have enrolled themselves to keep the peace. The Duke of Hamilton has raised his coal miner's wages from 2s. 6d per day to 4s., nearly one dollar. This is something to the credit of the noble Douglas. So our prospects are somewhat brighter, although there is much preparation for emigration. Few Scotch, however, now go to America. New Zealand is the principal outlet for our redundant population, and there they will carry into the wilderness the same Puritan faith and the same energies which from Plymouth Rock has made America "beloved at home and revered abroad."

Yours, &c. GLENBURN.

Winds of Ohio.

The Cincinnati Gazette says, that Dr. Drake of that City, has for many years kept a register of winds in that State, and says the Southwest wind prevails on the Ohio three-fourths of the year. It exhibits in character, the humid and the arid; the former prevailing through the night, and generally continuing two or three days after its commencement and alternating with the Northeast wind; it sinks the barometer more than any other ærial current, causing clouds, and general rain, which is often profuse. The arid Southwest wind commences between sunrise and 10 A. M. It is at first very gentle, increasing in force with the progress of the day, until 4 or 5 o'clock P. M., when it begins to subside. It ceases at sunset, and the succeeding night is clear and serene. This is the predominant wind in the hottest and dryest weather. Its prevalence in comparison with the humid is as eight to one. It is seldom attended with an atmosphere altogether cloudless, but never produces any other rain than a thunder shower. Dr. Drake seems to have noticed a remarkable peculiarity in this climate—the total absence of very high winds. We have no gales strictly speaking, nor storms accompanied with high wind; even the equinoctial storms frequently so terrible on the Atlantic coast, are seldom sufficiently severe to attract attention.

The Women of Turkey.

A writer in Blackwood says—"The lot of this portion of the Musselman population is much less than one would be led to expect. They certainly hold a secondary station in society; but brought up as they are in the most complete ignorance, they are unconscious of their degraded position, and know not that there is a better. They are, in general treated very kindly by their husbands and masters, and do not undergo, as it is supposed either capricious or brutal treatment. Although in Europe, they still believe a Turk to be constantly surrounded by a multitude of obelisks; at Constantinople there are very few Osmanlees who have three or even two wives; and even these lodge in separate mansions, in general far distant from each other. Almost all the Turks, with the exception of the above mentioned individuals, possess, in general, but one wife, they are the most faithful."

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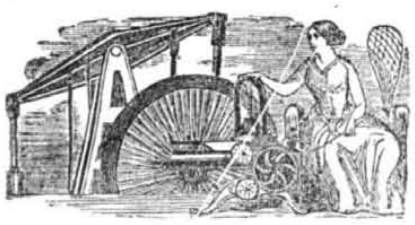


New Inventions.

Pneumatio Telegraph and Annunciator.

Mr. Ashe, Professor of Drawing, No. 133 Fulton st., this city, has invented an Air Annunciator, which from its simplicity will no doubt supersede others. Its principle consists in the compressible nature of the air, which by using two pistons of a very small diameter in a leaden tube, (or any number of tubes,) makes one strike a gong or bell at one end simply by pressing upon the piston at the other end. A leaden tube (which is chosen because it can easily navigate angles,) is made with small sheet brass cylinders, one at each end, and small pistons fitted in the same. The piston of the warning cylinder which strikes the gong or plate or bell, is made somewhat smaller in diameter than the other, so that any amount of force required may be exerted by pushing the other piston into the cylinder and making the warning one strike a bell, or a steel plate with wires numbered, or there may be a steel plate with buttons numbered on it, that by the piston striking will change their position and tell which number was struck on the plate, and thus do away with all the machinery of so many small cranks as are used in the common annunciator. There are a number of ways to complete the warning part, which the inventor will inform those of who desire information. The principle is as stated, the using of a piston to strike a bell, &c. by pushing another piston in a tube so as to use the force of compressed air to operate the warning or indicating piston, striking the most gentle or loudest tap.

Self-feeding Gold Pen.

Mr. Alfonse R. Crayfey, of Brooklyn, N. Y. has invented a very unique improvement in Gold Pens. A small oblong shield is placed inside of the pen which regulates the supply of ink to the writer in a most beautiful manner. We shall be able to present an engraving of the invention next week.

New Kind of Paving.

Mr. J. F. Foreman, of this city, has designed a new system of street paving, which consist in using no concrete substrata, but a substrata or secondary tier of flag paving.—This paving Mr. Foreman asserts will allow easier access to water and gas pipes that need repair, than can be obtained through a substrata of concrete, as all that has to be done is to lift the blocks and flags. He also calculates it to be cheaper. In connection with the paving he couples deeper gutters for drainage and covering them with perforated iron plates.

A New Mineral Useful in Arts.

Mr. Blage, of Sharon, Ohio, has patented a mineral discovered in his neighborhood, which promises to be of great value. When first dug up, it is of the consistence of tallow and gradually hardens in a few days, so as to resemble slate; and, finally, it becomes as hard as rock. It is of a blue color, is impervious to both water and fire, and admits of the finest polish. When reduced to powder, and mixed up with linseed oil, it has the appearance of black paint, and may be spread over wood, canvass, &c. Roofs have been guarded by it against fire: and as it does not absorb the rain, it protects the rafters from decay. It consists of about one-half of silica, one fourth alumina, with proportions of magnesia, black oxide, sulphate of iron, lime and carbon.

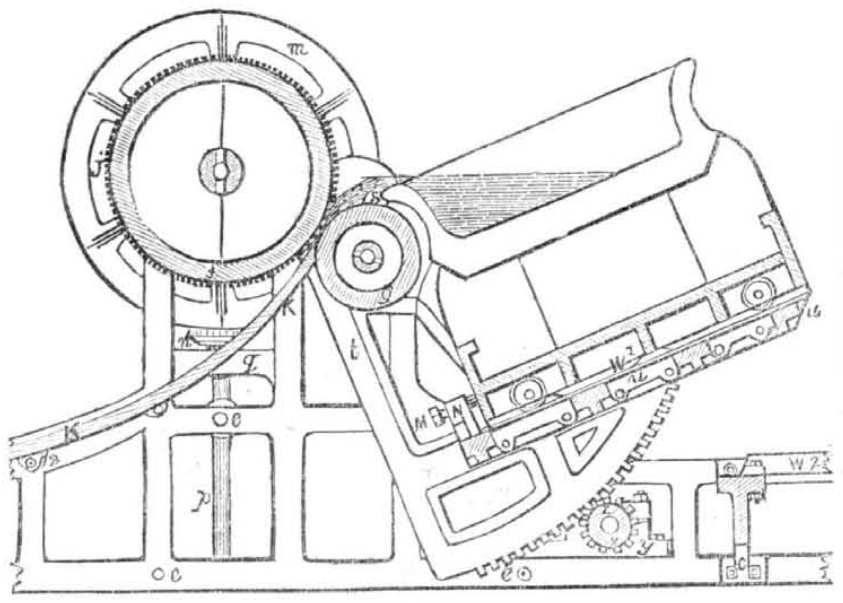
Window Fastener.

Mr. Joseph Nock, an ingenious mechanic of Philadelphia, has invented a new brass window Fastener, which will effectually prevent windows from being lifted by malicious and evil disposed persons, and thus prevent housebreaking and burglary.

Novel Parasol Sign.

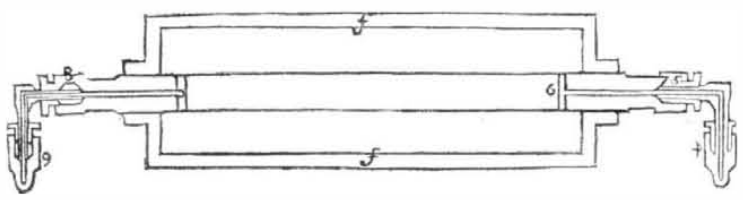
Mr. J. Custar, of Morristown, Pa., as we learn by the Herald has made a very ingenious application of clock machinery to exhibit as a sign for a parasol manufactory. It is made of one train of wheels, driven by a weight and has two motions the escapement and fly-wheel. The escapement motion is intended to keep the parasol open seven seconds, when the pin that raises it passes the drop and the parasol shuts. The escapement motion still goes on seven seconds more, when another pin on the pin wheel strikes a small drop and throws the escapement motion out, the fly motion then takes place and raises the parasol suddenly, when the escapement motion again comes into play. Thus it continues, raises in one second, remains up seven seconds, falls in one second, and remains closed seven seconds, and so on alternately.

MACHINE FOR GLASS MOULDING.---Figure 2.

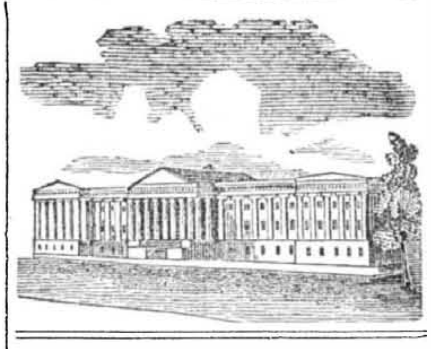


tion to these wheels the axis of the roller *f*, has on the outside of the framing a large bevel wheel *m*, driven by a pinion *n*, on the end of an upright shaft *p*, driven by an underlying shaft from the main driver. The upper part of the shaft *p*, is supported by a bracket *q*, projecting from the side frame; near the upper part of the framing there are two plummer blocks *r*, which form a support to the pins which project from the side of a piece of tilting frame. There are two of these pieces *t*, one on each side of the machine, and they are connected together by a third piece *u*, by bolts. The frame when thus put together is supported by pins *s s*, and occupies nearly the entire width between the side frames *a a*. The lower part of the piece *t*, has a segment of a tooth wheel formed on it and centred on the pins *s*, so that the tilting frame may move a portion of a circle on these pins. The piece *u*, has two small ribs or rails extending across and cast upon it, which form a continuation of the rails which conduct to the furnace. X, is a shaft extending across the frame supported by plumber blocks *y*, attached to the side frames *e*, which shaft *x*, has pinions *z*, upon it gearing with the segment of the tilting frame *t*. The shaft *x*, is also elongated to a convenient distance, and supported at its extremity by a frame of two side pieces connected by stretchers. The upper part of the frame carries two plummer blocks and a shaft; the shaft having a handle and a pinion upon it, which gears into a large spur wheel on the shaft X. By turning round the handle on X, it forcibly raises the tilting frame with any object that may be placed on it. There is an opening in the tilting frame, through which the axis of the roller *g*, passes; and this roller is sufficiently long to allow the required movement of the tilting frame. The rollers are supplied in this machine with water to keep them cool; the water is conveyed below the floor to the pipe 1; at 2, there is a branch which leads off from 1 to the axis of the roller *g*, which it enters through the stuffing box; the tube 1, proceeding further upwards, bends over and forms another stuffing box 4, which allows the upper roller *f*, to move a small distance horizontally, to alter the thickness of the plate. The water enters the axis of the roller *f*, by passing through the stuffing box 5; the axis of the roller is not hollow throughout, but the hollow part of it terminates at 6, (see fig 3,) where there are two side holes bored at right angles to it, which allow the water to pass into and occupy the large hollow space in the body of the roller. By a similar contrivance the water is allowed to flow out of the opposite end of the roller, passing through the stuffing boxes 8, 9, and descending the pipe is conveyed away under ground. A strong curved plate K, extends the entire width between the said frames, fitting closely up to the roller *g*, and secured to the frames by lugs. On this plate the sheets of hot glass slide down towards the flat bed, but which is broken off in the cuts; the side of the melting pot nearest to the machine has a curved lip, so as to overhang the roller *g*, nearly as far as the centre. The pin *s*, of the tilting frame is at its centre a little above the upper side of the roller *g*, so that the lip of the pot being in the position shewn in fig. 2, it does not shift from that spot far, as it may be tilted up.

Figure 3.



The mode of operating with this apparatus is as follows: When the glass is in a fit state for casting, the door is removed by a crane from the mouth of the furnace, and by the assistance of an iron hook, the carriage and its pot are easily rolled forward upon the rails before mentioned, to the tilting frame *t*, then they occupy the position shewn in fig. 1. The carriage and its pot are now moved forward until the set screws **M**, come in contact with the carriage; the office of these screws is to regulate the extent to which the lip of the pot shall overhang the roller *g*, so that when a new pot is used its proper position for pouring may be adjusted. The screws M, pass through stout lugs N, cast on the piece *u*; the handle on X being turned, the pot will be elevated, as shewn in fig. 2, when the glass passing between the rollers will be formed into sheets. When the pot is emptied, it is again lowered and returned to the furnace for a repetition of the preceding operations; the roller *f*, is furnished with a rib on its circumference, which is the whole of the roller; this at each revolution cuts the glass off into lengths.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending April 4, 1848.

To William Allen, jr., of Meriden, Conn., for improvement in operating and fastening Window Blinds. Patented April 4, 1848.

To Benjamin L. Johnson, of Cussawaga, Penn., for improvement in Blowers for Furnaces, &c. Patented April 4, 1848.

To Alanson C. Currier, (of Palmer,) and Abel Bradway, (of Monson,) Mass., for improvement in machinery for Jointing Staves. Patented April 4, 1848.

DESIGNS.

To William Hickok, of New York, for Design for Stoves Patented April 4, 1848.

To George W. Wood, of Utica, N. Y., for Design of Plates for Cooking Stoves. Patented April 4, 1848.

INVENTOR'S CLAIMS.

Ship Building.

By Richard F. Soper, of Philadelphia, Pa Improvement in Ship Building. Patented Nov. 13th, 1847. Claim.—What I claim as my invention and desire to secure by letters patent is constructing ships and other vessels with hollow iron ribs, rolled as described and bound together by means of a wooden planking and ceiling substantially as described, whereby a great saving in weight and metal is effected—said hollow ribs affording a means of introducing oil which by the motion of the vessel is made to circulate and penetrate to the bolts and fastenings, preventing the rotting of the planks and the oxidation of the metal as described.

Cotton Cleaner.

John Wind, of Thomasville, Ga. Improvement in Cotton Cleaners. Patented Nov. 13th 1847. Claim.—Having thus fully described my improved Cotton Thresher and Cleaner, what I claim therein as new and desire to secure by letters patent, is the placing the breaking wings in a continuous helical direction upon a conical skeleton cylinder, and combining the same with a skeleton concave and casing, substantially in the manner and for the purpose herein set forth.

Horse Shoe Machines.

By Philip Pitts Read, of Durham, Maine. Improvement in Horse Shoe Machines. Patented Nov. 13th, 1847. Claim.—I do not claim the invention of making horse shoes by bending the bar of iron that forms the shoe around a horse-shoe shaped former and pressing the crease and nail holes; but what I do claim as my invention and desire to secure by letters patent, is the particular manner of combining the soliding horse-shoe shaped follower or fuller C, for bending the bar of iron around the former G, to form the horse shoes, with the horse-shoe shaped die E, and spring bar U, connected therewith for stamping the crease and nail holes in the shoe, by the sudden blow of a falling weight H, which again rebounds from the shoe as soon as the weight commences to rise by the action of the windlass rendering the fibres of the iron of which the shoe is composed close, compact, tough and lasting; instead of being pressed or rolled, which is an inferior mode of manufacturing shoes, leaving them in a loose, brittle state, not well adapted to the purpose for which they are intended—the several parts of the said combination being made, arranged and operated in the manner and for the purpose above set forth or other mode substantially the same. [The letters above have reference to the drawings of the machine.]

Since the introduction of chloroform into dentistry, patients do not suffer the extraction of a tooth, but have the pleasure of losing one.

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NEW YORK, APRIL 15, 1848.

Patents for Combinations.

There are some who need to be informed regarding distinct improvements on distinct machines and the securing of them under *one* patent. This cannot be done. Several distinct improvements on one machine may be united in one patent, but several improvements in two different machines having distinct operations cannot be included in the same patent. This is certainly plain common sense and easily perceived, yet we have had not a few communications requesting information on this very point. It is certainly plain that no one patent could be granted for exclusive rights to more than one machine.—Different improvements in different machines, however, if combined together to produce a certain result, can at once be covered with a patent, and different parts of many machines, though all of them were as old as the pyramids, if they are combined together in one machine as they never have been combined before, to produce a certain result, can be patented, but the claim must be as that of Mr. Jones, in No. 28 of this volume of the Scientific American, limited to the combination alone. In the case of Barrett *vs.* Hall, before Justice Wilde in the Supreme Court of Massachusetts, he decided that a joint patent for a reel and for a lap frame granted to two persons was void, because the inventions were separate and the machines also, *but* separate patents could be sustained for each machine.

A new improvement on any patented machine will not secure the improver, although he may get a patent, against infringing the law, if he uses any part covered with another patent. Many a very important improvement may be entirely worthless to the inventor from this very fact, but there is no remedy except the consent of the primary patentee. Two or more inventors who invent different parts which jointly are useful, but separate useless, a joint patent alone is their security. With a patent for each part, would it or could it be granted, they would be just as valueless as the disjointed parts of the machine—like the separate parts of a skeleton—the wreck of a noble structure.

Magnetic Action of Matter.

Electricity is a substance, but of what shape or color or appearance, we cannot tell. Like spirit it is invisible, and like spirit too, it is as rapid in flight as the imagination. That it is nearly allied to the spiritual world—the life principle of all animated nature, there is too much evidence to admit of a single doubt.—But how it operates, how far its agency effects the developement of natural productions, we are not yet far enough advanced on the voyage of exploration to determine. Many years must yet elapse ere we define its boundaries—if ever. Much, however, has been done, and much is doing every day, to advance our knowledge of this interesting science. Magnetism, the sister of electricity, is as wonderful a natural phenomenon, for a phenomenon it still is, as electricity. Some believe that all the planets, yea the whole universe, is sustained, the one part in relation to the other by magnetism, and that electricity resolves the minutia into proper form and beauty The sun itself they say is a great magnet and the planets of our system are sustained in their relation to it by this law, not that of gravity.—There is much force given to these opinions by the discoveries of Farraday. He has proven conclusively that different bodies are acted upon by the magnetic forces in two opposite modes, the one magnetic, the other dia-magnetic, and from this some have concluded that a better explanation is given to the revolutions of our planet than by the law of centripedal and centrifugal forces. "If by the law of gravitation," say they, "the earth attracts an apple as it falls from the tree, why does not the same law hold true in regard to the sun, to which the earth is no more than an apple?"

Safety of Steam Vessels.

The Committee appointed by Congress to report relative to the safety of passengers on board of steam vessels, have reported that accidents from explosions cannot be traced to ignorant engineers, as the most unskilled among them know in what condition boilers ought to be kept to prevent explosion. It is rather the want of the requisite moral qualifications than of knowledge that leads to the accidents alluded to—the want of attention and prudence on the part of the engineer, whose duty it is to keep the boilers in a proper condition to secure them against explosion.

The management of the boiler, says the Report, is rather a matter of observation and vigilance, of sound judgement and unceasing care. The control of the engine requires more skill to keep its complicated machinery in good order, and to know how to put it in repair. Care, judgment, and precaution, therefore, with a moderate degree of skill, are the grand requisites in good engineers, and any greater knowledge of the science than they now possess, while perhaps it would enable them theoretically to account for these disasters, would prove of no greater practical utility, to them than the knowledge of the expansive force of gases to the soldier in safely loading his musket.

The Report also says that, on many sugar plantations of the south, the engines and boilers are safely etrusted to the slaves; and that where professional engineers are employed by the planters, it is less from the fear of explosion than for the purpose of having constantly at their disposal some person competent to repair the engine and mill, in case of accident, thereby avoiding the expense and delay to which they might be exposed if no such person were at hand.

Scaliola.

This is is the name of a kind of ornamental plaster work produced by applying a pap made of finely ground plaster of Paris mixed with a weak solution of glue, upon any figure formed of laths nailed together, or sometimes it is made of brick work, and strewing its surface, while soft, with splinters of spar, marble, granite, bits of concrete, colored plaster, or veins of clay, in a semi-fluid state.—The substances employed to color the spots are the ochres of iron, *terra de sienna*, chrome and alkanet root. The surface of the column is turned smooth upon a lathe, then it is polished with stones of different fineness, and finished with some plaster pap to give it lustre. Pillars and flat surfaces are smoothed with planes having the chisels finely serrated. After this they are finely polished with plaster by friction. The glue is the principal cause of the gloss, but it makes the surface to be easily injured by moisture, or even damp air.—Some use a very small portion of copal varnish along with the glue, which enables the Scaliola to take both a finer polish and stand dampness better, than simply to use the glue alone.

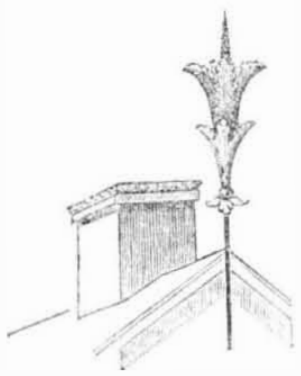
The above receipt was procured for the readers of the Scientific American at some expense, and it is hoped that some of our contemporaries will be a little more liberal in giving us credit for it than they are in the habit of doing to the mass of our originals which they so often copy, as there is one ingredient in it not generally known, in making it keep its gloss.

Magnet Water Guage.

Some of our exchanges state that a gentleman in Covington, Ky., has invented a machine, consisting of three valves, each of which contains a magnet and a needle, by which the amount of water and steam in boilers, may at all times be accurately known.—It is so constructed that every inch of the increase or decrease of water in the boilers to which it is attached, can be immediately told.

There is something in all statements like the one quoted above, that appears at once to those who are acquainted with these things, erroneous in description. Whoever heard of *a machine consisting of three valves.*

Lightning Rods.



This engraving is a design for lightning Conductors, by Mr. Stephen D. Pool of Lynn, Mass., and exhibits both taste and ingenuity. But let Mr. Pool speak for himself, as he ably can:—

"I have an idea regarding lightning rods, which so far I have seen, is new. It is this: Let a disc of copper be cut into the form of serrated leaves, 4 or 6, pointing from the center, but joined at their base; this being firmly fixed upon the upper extremity of the rod, is to be turned up and wrought into some tasteful and elegant form. The brush of points presented by this arrangement must be most favorable for the reception of the fluid, while the conducting power could be increased and appearance improved by silvering, platinizing, or even gilding; the form, of course, could be varied to suit the taste or style of architecture. Ornaments for different parts of the roofs of rural cottages might be easily made from the same material combining elegance and utility, and furnishing, it seems to me, far greater security than the blunt, rusty iron rods, which are in so general use. Suppose it is desirable to avoid any considerable projection; let a collar or border of pointed leaves be passed around the head of the chimney, from this let slips of sheathing copper be carried to the point of the roof, thence down to the eaves at the corner of the house, the slips raised in points at the edge with a stroke of a cold-chisel, furnished at the prominent places with a leaflet or other suitable ornament, and then the whole connected with the ground.

Intemperance.

A short time ago at a Temperance meeting held in Faneuil Hall, Boston, Gov. Briggs stated that the report of the committee appointed to inquire in regard to the idiots in Massachusetts, showed that there were from 1200 to 1300 of that unfortunate class and also the astounding fact that 1100 to 1200 of them were born of drunken parents! This is a sickening picture and calculated to repress the pride of our boasted civilization.

The Rev. Mr. Smith lately delivered a lecture at Worcester, Mass., in which he stated that no less than 38,877 gallons of alcoholic liquors were received in the stores of Worcester during the year 1847, which with 11,800 for the druggists amounted to 50,677 gallons. These facts are heart rending to the lovers of morality, for intemperance and crime are twin sisters of the Evil One.

Sending Money by Mail.

It would be a great blessing to our people if the Post Office would be the agency of transmitting money in small packages of specie or large bills. A small per centage would not only be cheerfully prepaid, but it would at the same time be the means of an increase in the revenue without much increase in expenditure. All letters should be prepaid, but the price should be a little lower than the present rate.

Riding in Cars.

A gentleman lately suggested, that it was much more healthful to take the forward part of the car, when there is a fire in it and many breaths, as, by the current created by the motion of the car, all the carbonic acid is speedily conveyed to the back end of the car. There is considerable in the suggestion, as any one will perceive who will take the trouble to pass from one end of a heated car to the other. There is a manifest difference in the atmosphere.

For the Scientific American.

Economy of Power in Cotton Factories.

When shafts and gears are used, it is customary—indeed *necessary*—to run the "main lines" at a lower speed than can be done with belts. The advantage of having the shafts run at the highest speed convenient in a cotton mill, seems not to be generally appreciated.—As a general rule 120 revolutions per minute should be the minimum speed—a higher rate would give the maximum advantage, but this is the most convenient for driving cotton machinery.

I remember an instance in my own experience where a mill driven by an 80 horse power engine could not be brought to the usual speed in damp weather, in consequence of the increased weight caused by bands tightening, &c. The shafting was re-arranged so as to drive it about 10 revolutions per minute faster, and the consequence was a full supply of power for all states of the atmosphere.—The philosophy of this may appear when we consider that the friction of shaft journals does not increase in a ratio corresponding with the increase of their velocity, and hence a proportionably less amount of power is expended in friction, by the act of conveying it from the first mover to the shafting. The latter too, viewed as a magazine of power, is less affected by the drafts made upon it by the several machines, when running at a high, than at a low speed, and consequently not subjected to the strain or (which resolves itself into the same thing) friction that accompanies any machinery when working at a mechanical disadvantage. The weight of metal dispensed with, if cast iron pullies are used for driving on the shafting is an important item, in connection with high speed, being in a mill with 300 looms, 1400 lbs. less if the shafting runs at 120 than it would require at 109 revolutions per minute.

W. MONTGOMERY.

(*To be continued.*)

A Government Speculation.

At Kensington, Philadelphia, there is a huge circular structure, formed of substantial timber, probably thirty feet high, and as many in diameter. It stands upon a vacant lot below the foundry of Messrs. Reaney, Nefie, & Co., and was constructed for the government fifteen years since. It was intended to have the structure placed upon the Brandywine shoals and by sinking it with stone in the sand, form a solid foundation for a lighthouse. The project was, however, given up after a spending a large amount of money in its construction, which has, perhaps, been trebled by the rent paid since for the spot it now occupies.

Two Important Bills Defeated.

The bill to incorporate the Syracuse Railroad has been lost in our Legislature. The bill to regulate the hours of labor has also been lost.

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The second volume of the Scientific American, bound in a superb manner, containing 416 pages choice reading matter, a list of all the patents granted at the United States Patent Office during the year, and illustrated with over 300 beautiful descriptive engravings of new and improved machines, for sale at this office—Price $2,75. The volume may also be had in sheets, in suitable form for mailing—at $2.

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Electric Telegraph Experiments.

VERMONT MEDICAL COLLEGE,
Woodstock, March 27, 1848.

To the Editor of the Sci. American.

In your valuable paper of March 4th, is contained the *great* discovery of the use of *water* alone in Grove's Battery, instead of sulphuric acid and water, as the motive power. The least acquaintance with this battery or with any of the common forms, must convince you and all, that the zinc must be acted on chemically by means of an acid. If that acid is not mingled with the water which surrounds the zinc, it must be obtained from some other source, and in the case alluded to, was obtained from the passing of the nitric acid through the porous cup to the zinc It has long been known that nitric acid is an active exciter of electricity on the zinc. As soon as the nitric acid should pass through to the zinc in sufficient quantity, the action would begin, and be increased with the increase, and be diminished with the diminution, of the acid. But, the mercury on the amalgamated zinc would be attacked, and the plates would ere long need re-amalgamation. Well known facts and principles lead to these *necessary* conclusions.

As I had just received a new Grove's Battery of eighteen cups, I determined to try the experiment, and test the 'hydropathic' discovery. The battery was new and clean and in fine state. I charged the zinc plates with pure water and put strong nitric acid in the porous cups. Aided by an assistant, this filling was done simultaneously and rapidly.—The following were the results:

1. On bringing the copper wires from the poles into water, there was indication of only the slightest decomposition of water.

2. On attaching the poles to an electro-magnetic apparatus, there was not the least developement of magnetism at either end of the soft iron. Hence, such a battery of even 18 cups would not move the common Telegraph lever, while three or four cups with the ordinary exciting diluted acid is amply sufficient

3. Waiting a few moments I tried these same experiments again, and found the power of the battery had somewhat increased.—The decomposition and magnetism were thrice as much. Hence the nitric acid had passed in some quantity through the porous cup to the zinc.

4. Repeating the same experiment at the end of half an hour, the activity of the battery had greatly increased, and both the results, already mentioned, were far more manifest.

As I have repeatedly used the same size of Grove's Battery charged in the common way with twelve of water to one of sulphuric acid for the zinc and ordinary nitric for the porous cup, it is evident that the power of the hydropathic solution was far the less efficient of the two.

5. In about an hour and half the "hydropathic system," had attained its maximum efficiency, and I repeated the above experiments before the medical class, and added the following. A large *dancing* iron in the proper helix was suspended or made to dance in the usual manner. A rod of eight inches length and nearly one-fourth of an inch in diameter was made to play beautifully. Dutch gold leaf was finely deflorated, and both silver leaf and gold leaf burned distinctly.

6. When the circuit had been broken, on closing it, the usual effervescence took place around the platinized platina of the porous cup. Had the porous cup been removed and the nitric acid been mingled with the water about the zinc, and the battery thus have been changed into the form actually of Smea's battery, the same results would doubtless have taken place, only with far more energy.

7. In two or three hours afterwards the power of the battery was greatly diminished. The nitric acid in the porous cup was weaker, and the nitrate of mercury and of zinc in the water had lessened its specific gravity compared with that of the nitric acid so that the nitric acid would pass in much less quantity to the zinc. After several hours more the action nearly ceased, and the plates were taken from the solution and the remaining weak nitric acid was preserved.

8. An examination of the zinc plates showed that the mercury had in part been removed from them, and especially where the porous cups had been in contact with the zinc plates or nearer to them. The "used up" nitric acid showed that the porous cups must be refilled with that powerful acid, and this process be often repeated. Re-amalgamation must be necessary; how often, it is not easy to determine from these experiments. When the zinc is used with dilute sulphuric acid saturated with sulphate of soda, re-amalgamation is not necessary in two months; that this "hydropathic system" will require it very much oftener, there can be no doubt.

In conclusion I venture to infer, that the cost of sustaining the batteries on the "hydropathic system" will be at least five times as great as by the solution just mentioned.

Your obd't. C. DEWEY.

P. S. I have used the phrase "hydropathic system" with no invidious meaning, but as a happy expression, already made public, of the meaning to be conveyed. I rejoice in any improvement in science and art, especially in that which will disseminate knowledge and facilitate communication between the different parts of our country in a cheaper as well as expeditious manner. Honor to whom honor is due. C. D.

Bell Casting.

The casting of common house bells or hand-bells differs in no wise from the processes relating to small castings in metal generally; but for church-bells the case is otherwise. The production of a *sonorous* quality, in addition to many of those which pertain to all large castings in mixed metal, gives occasion for many scrupulous arrangements in the management of the foundry. A bell-foundry must have a furnace which will contain many tons of metal, for the whole of the casting for one bell is made at once. The arrangements as to the central core or mould for casting a large bell are thus made:—Contiguous to the furnace is a pit deeper than the height of the bell. In the centre of this pit is built up a rough mass of brick work, somewhat smaller than the interior of the bell; and this is coated externally with a mixture of earth and horse dung, applied in successive layers, and worked smooth by guages, until the *exterior* of the core presents exactly the same size and shape as the *interior* of the intended bell. When the prepared core is thoroughly dried by means of fires, a second coating of the same composition is laid on of the same thickness as the intended bell; this coating, which is called the "model," is formed of earth and hair, and is, like the former, brought to a very smooth and correct surface by guages, the exact counterpart of the exterior of the bell. A third coating is then applied, called the "shell," much thicker than the others, and formed of a somewhat different composition. A little tan-dust is sprinkled on the first coating, or core, before the second, or model is applied; and also on the latter before the outer coating or shell is laid on. When all is well dried, the "shell," is lifted off from the "model," and the model is picked or cut off from the core piecemeal. If we suppose the core the model, and the shell to be three hemispherical cups placed one within another, and the middle one to be removed, it will serve to illustrate how a vacant space comes to be formed between the core and the shell: and when we further bear in mind that the exterior of the core gives the internal form to the bell, and the interior of the shell the external form, the object of the whole arrangement will be very clearly seen.

This internal cavity of the mould, between the core and the shell, is that into which the metal is to be poured. The casting pit is filled up with loam or earth, to the level of the top of the mould; a shallow channel is cut in the loam from the furnace to an orifice communicating with the vacant space in the mould; and two other orifices are left for the escape of air as the melted metal enters. Meanwhile the metal is being melted in the furnace. The tin employed is in the form of blocks, the copper is old ship-sheathing and other fragments. These are melted in a reverbatory furnace, by the heat of billets of wood. All being ready, the earth which stops an orifice in the lower part of the furnace is knocked or dug away, a narrow jet instantly pours out from the opening, and a stream of liquid fire (for so it seems to the eye) runs along the channel in the loam, and flows into the mould, bubbling and hissing and giving forth greenish sparks. When the mould is full, the metal is allowed to remain till perfectly cool; the loam is then removed the external "shell" lifted or cut from the bell, the bell lifted off the core, and the core pulled down. If the bell be very large, it alone occupies the pit; but if of smaller size such as from three or four to ten or twelve hundred weights, six or eight may be cast in one pit at one time. The tone of a bell depends conjointly on the diameter and the thickness; a small bell or a thick bell giving relatively, a more acute tone than one which is either larger or thinner. Hence the founder regulates the diameter and thickness according to the musical pitch of the tone which the bell is to yield; but as this cannot be rigidly attained by casting only, the bells (say a set to form chimes) are attained by chipping away some of the metal with a sharp-pointed hammer: reducing the diameter at the lower edge when the tone is too low, and reducing the thickness at the part where the hammer strikes when the tone is too acute.

Preserved Potatoes.

An importation of considerable novelty and interest has recently taken place by a vessel arrived from Gottenburg, consisting of some casks of potatoes, in a state of preservation. It is known that this description of vegetable is free from duty when imported into this country in a raw state, the privilege extending to all foreign countries, and for a definite period, without reference to the mode of introduction, and the existing navigation laws, and this parcel was entered as being free of duty. On examination, however, by the officers of the revenue, the contents were found to have undergone a process of preserving by which they were considered to become liable to an *ad valorem* duty of ten per cent, as manufactured goods, the process which they had undergone being the division of the potatoes into small pieces and drying them. We believe that this is a perfect novelty with respect to the importation of the vegetable from foreign countries.

A patent is in existence for a preserved preparation of the potato in this country, which is supplied to the East India Company and Emigrants, and of which an analysis is given by Dr. Ure, the eminent professor of analytical chemistry, to the effect that it is found by chemical analysis to contain the whole nutritious properties of that root in a pure concentrated state, also sixty parts in the hundred at least of starch, nearly thirty of a soluble fibrine of demulcent anti scorbulent quality, five of a vegetable albumen of the nature somewhat of the white of an egg, and five of a lubricating gum—that the fibrine and albumen render it more light of digestion, and the gum more demulcent to the stomach than wheat flour, with which also it may be regarded nearly equally nutritious, and more so than peas, beans, sago, or arrow-root.

It was a matter of some doubt whether this importation was in any way affected by the existing patent alluded to, but we believe it has been decided in the negative, and as of an entirely different character, although similarly designated. Notwithstanding that the importation is a novel one it is understood to be a common preparation of the vegetable in Sweden, from which country this supply took place, and to have been so for a long period, and that the only process in manufacture to which the potatoes have been subjected is that of being dried and forced through a sieve or colander, which, however, is considered to render them liable to the *ad valorem* duty before mentioned.—*London Mining Jour.*

Strength of Cordage.

The strength of ropes and cords depends on the fineness of the strands. Damp cordage is stronger than dry. Silk cords have three times the strength of those of flax of the same diameter, and a remarkable increase of strength is obtained by gluing the threads together. A hempen cord, the threads of which are glued, is stronger than the best wrought iron.

The Mining Population of Scotland.

There are now about one hundred blast furnaces at work in Scotland, each of which will produce on an average five thousand tons of pig-iron a year, or, altogether, about half a million tons. For all the purposes connected with the manufacture of one ton of pig-iron, taking it in round numbers, there will be required about 3 tons of coal, 35 cwt., of calcined iron-stone, and 10 cwt., of lime. According to the restricted "darg" of the Lanarkshire miners and colliers, the labor of one man, supposing him to work the whole, will be equal to the produce of raw material for 50 tons of pig-iron a year. The manufacture of pig-iron in Scotland will therefore give employment to 10,000 colliers and miners. The manufacture of malleable iron in Scotland will be somewhere about 80,000 tons per annum, will give employment to 1000 colliers, each ton requiring about four tons of raw coal for its manufacture. Altogether this will give employment to 11,000 colliers and miners in the manufacture of iron alone in Scotand. For each man employed, the population may be estimated at four which will give a population of between forty and fifty thousand.

For supplying the consumption of Glasgow 3000 colliers are required, and taking the whole of Scotland, the number of colliers and miners absolutely working will be about 30,000, and the population about 120,000. This is altogether independent of oncostmen, laborers, mechanics, and others employed in connection with our colleries and ironstone mines, which will give at least one-half more. The population, therefore, belonging to their coal and ironstone working, cannot be estimated at less than 180,000 and is rapidly increasing every day. The quantity of pig-iron made has doubled within the last seven years which must have added to the mining population above 20,000.

Previous to the year 1775, colliers were treated as slaves belonging to the property where they labored. The British parliament that year passed an act which "declared that colliers and salters were to be no longer 'transferrable with the collieries and salt works.' but upon certain conditions which were then deemed 'reasonable,' they were gradually emancipated and set free, and others prevented from coming into such a state of servitude." Since that time, many laudible efforts have been made for the elevation of this portion of British subjects, but their condition still demands the attention of the friends of degraded humanity.

TO CORRESPONDENTS.

"J. B, of O."—Yes. You seem to appreciate the benefit of publishing engravings of your inventions in the Scientific American.—We could mention hundreds who have made extensive sales and realized large profits by just publishing their inventions in the Scientific American. The cost of a cut for your last improvement will be $8. It will appear in two or three weeks.

"J. C. Jr. of N. Y."—We feel under obligation to you for the fine list of subscribers with which you favored us last week, and we hope we shall have occasion to tender our thanks to many others for like favors.

"M. S. of Vt."—See fourth page.

"R. M. J. of Mass."—Get an engraving of your machine, it will only cost $5; better than a caveat.

"S. R of N. Y."—You say that you can gain power by a larger fly. We say you cannot, you are, however, welcome to your opinion, and would recommend your flys as an easy way to transfer a four horse power engine, to one of 20 horse power.

"A. N. O. of R. I."—We really would be happy to give advice, but scarcely know what to say. The name given was the signature and we thought it was also the name proper.

"A. H. of Ky."—The hardness of the castings, we are afraid is not attributed to the true cause, as some of the softest castings in the world are made from the coke of bituminous coal. Copperas is the sulphate of iron. Sulphur is found but in small proportions in any iron. It may be phosphate that is the cause of the hardness. See that you are not chilling too rapidly by damp sand. We know

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of no process to purify the coke, or the impurity in the melting. We can only recommend rapid melting and extreme heat, so that as little carbon as possible may be combined with the iron. It is the excess of carbon that makes iron hard, the less carbon it has the softer it will be.

"J. M. H. of Ohio."—Steel bells will not answer for those of large calibre. You can get an eccentric chuck by writing to Joseph Hydes Starbuck's Foundry, Troy, New York. We do not know their price. The price of Perkin's lathe you will find out by letter to Perkins, Hudson, as we cannot say whether it is five or six hundred dollars.

"G. T. of Oswego"—Your capstan is new in combination.—There is no other of like construction so far as we are aware of, in use. It is good.

"C. L. of Rockville —The law allows two years. Many speak well of your windlass. We have not been able to answer you by mail.

"B. B. of Me."—Much obliged to you for your interest in the Scientific. We can make a wood cut from a good drawing, equally as well as with the model, though not a perspective from a sectional.

"C. B. W. of Mass."—Gov. Briggs was not very correct in his opinion. According to his views, any person who has seen a drawing or model of another person's invention can take out a patent for the same. Get up your model as soon as possible and make the drawing as directed, we will do the business, at a very reasonable price but cannot tell how much till we have some more information of the work to be done. Some specifications are easy and others difficult. 30 dollars is the patent office fee. It would be six months at least before your application would be examined in due order. We do not think such a cutting wheel is in use or has been used.

"J. C. of Mass."—Your model is received. We shall write in a few days.

"E. C. of Ill."—Your communication has just been received.

Spirit Gas.

We frequently hear of accidents from explosions of spirit gas. This is a composition of rectified alcohol and turpentine. It should never be used in families as it is very explosive. Camphene is not explosive and should always be used in preference to what is called composition.

Harrisburg Furnace Burned.

A short time ago the wood work of Gov. Porter's extensive anthracite Furnace at Harrisburg, took fire from the slag running out from the stack against the corner of the building, and in about two hours all the combustible materials of the furnace were entirely destroyed, and the engine, pumps, blowing cylinders, and other fixtures much injured.

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Applications for Patents made at this office, on the most reasonable terms. Neat drawings, specifications, and engravings of the first character, and cheaper than anywhere else. Notices of new inventions, Agency for the sale of Patent Rights, and all business of that nature, promptly attended to. Those who have patent rights to dispose of will find a good opportunity and field for their sale—such as Horse Power Machines and Waterwheels of every description. The largest circulation in the world for advertisements of inventions, &c.

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PERSONS residing in any part of the United States who are in want of Machines Engines, Lathes, or any description of machinery, can have their orders promptly executed by addressing the Publishers of this paper. From an extensive acquaintance among the principal machinists and a long acperience in mechanical matters they have uncommon facilities for the selection of the best machinery and will faithfully attend to any business entrusted to their care. MUNN & CO. a15

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No. 42 Gold Street, New York.

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a15 4t

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Having taken the proper means for securing a patent for this new mode, which he has called the Wind Mill Principle, in contradistinction to that of the paddle wheel in general use at this time, he is desirous that its merits may undergo the ordeal of philosophical investigation, mechanical skill and practical experience; confident, that in it will be found the following, amongst other advantages, namely, simplicity and cheapness of construction, economy of power, in the vanes entering the water at an angle less than 90 degrees with the line of motion; and also, in acquiring a greater velocity to the vanes than can be attained by any other means with the same amount of power.

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ABR'M. TAYLOR, No. 193 Second street,
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Valuable Mill Privilege.

FOR SALE.—The valuable Mill privilege situated in Roxbury, Mass., formerly known as Wait's Mills, now belonging to the heirs of Richard White, is now offered for sale, together with about 10,000 feet of land, and buildings thereon, including a Grist Mill containing two run of stones, turning shop, dwelling house and barn. The above establishment is now doing a good business, it being a long established stand, and is well adapted for manufacturing purposes. Apply to RICHARD WHITE, on the premises or to JOHN HEATH, Linden Place, Brookline.

Roxbury, Mass., March, 24, 1848. aS 3t*

STEAM ENGINES.

THE Subscriber has in process of manufacture 150 Steam Engines from 5 to 20 horse power, which will be finished by the 1st of May. Also 50 from 25 to 100 horse power, to be finished in June and July. The subscriber has been long engaged in the manufacturing of Stationary Engines, and makes a busi- of that alone. He feels assured that he can make a better article and for less money than any other establishment in the country. The engines are fitted up with heavy iron beds, planed and finished the whole length, with cast steel piston and valve rods. The shafts and connecting rods are of the best wrought iron. The piston is an entirely new article making it doubly secure against leakage and will last for years. They are fitted up with a patent cut-off, of an entire new construction, simple in its arrangement, not liable to get out of order, and can be adjusted to cut off with any length of stroke while the engine is in operation, or thrown off entirely if required. WM. BURDON,

a1 4t* No. 102 Front st, Brooklyn, L. I.

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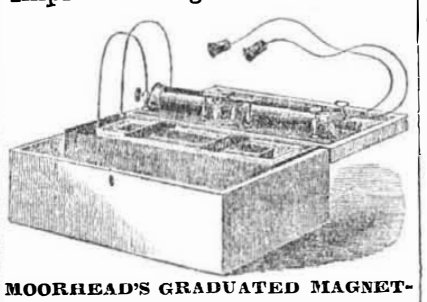


MOORHEAD'S GRADUATED MAGNETIC MACHINES.

IT is now universally admitted by the learned and scientific, that the mysterious power called Galvanism or Magnetism, is in fact the principle of vitality or life, and that Disease in many of its most painful forms is entirely owing to the absence of this Galvanic or Magnetic power in its healthy proportions If then we can readily supply this wondrous power, when it is thus deficient, we can successfully combat disease; and this has been fully and perfectly attained by the present beautiful and scientific instrument.

Moorhead's Graduated Magnetic Machine is an important improvement over all other forms of manufacture, and has been adopted by the Medical Profession generally, as being the most perfect, convenient and effective Magnetic machine in use. It is exceedingly simple in construction, and therefore not liable to get out of order, as is the case with all other instruments. It admits of the most perfect control, and can be graduated to any power, adapted to the most tender infant, or sufficient for the strongest adult, at the option of the operator. The Magnetic influence is imparted in a continuous manner, and with no unpleasant sensation to the most delicate patient. It requires no assistant in its use, and is in every respect entirely harmless.

Moorhead's Magnetic Machines are used with positive and permanent success in all cases of Rheumatism, acute or chronic, seated either in the head, joints or limbs; Gout, Tic Doloreux, Nervous and Sick Headache, Paralysis, Palsy, Fits, Epilepsy, Dyspepsia, Palpitation of the Heart, Spinal and Hip Complaints, Stiffness of the Joints, Lumbago, Neuralgia, Nervous Tremors, General Debility, Deficiency of Ne vous and Physical Energy, and all Nervous Diseases. As a preventive for Apoplexy, the machine is confidently recommended, and in the most confirmed cases of Scrofula, Dropsy, Erisypelas, Deafness, Curvature of the Spine, and all similar complaints, its effects are equally successful.

Each Machine is compactly arranged with the Battery and all necessary appliances, put up in neat rosewood or black walnut boxes. Accompanying each is a new Manual, containing full and simple directions for its use and application in the various diseases in which it is recommended. Any person of ordinary intelligence can successfully use this machine, as everything regarding it is perfectly simple and intelligible.

Every family should possess one of these beautiful instruments. It will always be found a valuable companion, and very often the best physician in time of need.

☞ PARTICULAR NOTICE ☜

The wonderful efficacy and increasing success of the **Magnetic Machines** has induced a desire to place them within the reach of all who may need them; and the proprietor respectfully announces, that in consequence of his late improvements and increased facilities, he has been enabled to place the price for each machine, complete in every respect and warranted at

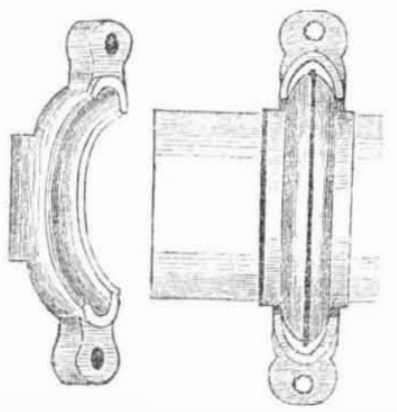
TWELVE DOLLARS.

The Graduated Magnetic Machines are manufactured and sold wholesale and retail, by

D. C. MOORHEAD, 182 Broadway, New York.

☞ **MUNN & CO.** have been appointed Agents for **Moorhead's Magnetic Machines,** and all Orders addressed to Munn & Co., accompanied with the Cash, will be promptly and carefully fulfilled.

☞ These Machines can be sent with perfect safety to any part of the country. m11 3m



Clasp Coupling Joint.

MESSRS. WEST & THOMPSON would respectfully call the attention of Engineers, Owners, or Agents of Steamboats, proprietors of Factories and others, to their new and improved method of jointing steam and other pipes together, by which means any person is enabled to connect them. For simplicity and perfection they are not equalled, and the price of their Clasp Joints will be found cheaper than the others, as they do not require any flanges, brazed or soldered on the pipe, no holes to drill, or grummets to make, nor white or red lead used to make them tight; and their weight is not one half that of the old Flange Joint, They may be seen and obtained at the office of the Patentee, 29 Centre street, near the City Hall, where all orders left will be punctually attended to.

This is to certify that I have examined what is called West & Thompson's Clasp Coupling Joint, for pipes to conduct steam and other fluids, and consider it to be a new and most invaluable improvement.

m25 ROBERT L. STEVENS.

AMERICAN HARDWARE.

THE SUBSCRIBER having been engaged in selling American Hardware on commission for 7 years, solicits consignments from manufacturers, and will refer to those who have employed him the above number of years. SAMUEL C. HILLS,

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Premium for Back Numbers,

WE will pay 10 cents each for 100 copies, No. 16, Vol. 2, Scientific American, delivered at this office, free of expense and in good order.

f26 MUNN & CO

Lamps, Chandeliers,

CANDELABRA, GIRANDOLES, RICH CHINA AND BOHEMIAN GLASS VASES, HALL LANTERNS, &c.

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Solar Lamps—Gilt, Bronze and Silvered, in great variety.
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Bracket do do do
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OILS—Sperm, Whale and Lard, of the best quality
Superior Camphene and Burning Fluid.

November 29, 1847. d18 6m

Gutta Percha Bands.

THE undersigned have been appointed Agents by the American Gutta Percha Company, and are now in readiness to furnish Bands and Belting of any size or length, at the following

SCALE OF PRICES PER FOOT.

Inches.	Cents.	Inches.	Cents.	Inches.	Cnts.
2	14	5	38	9	71
2 1-2	17	5 1-2	40	9 1-2	73
2 3-4	19	6	45	10	80
3	20	6 1-2	49	10 1-2	85
3 1-2	26	7	57	11	90
3 3-4	28	7 1-2	58	11 1-2	95
4	29	8	63	12	100
4 1-2	35	8 1-2	67		

All Bands of extra thickness will be made by special agreement. Light Bands for Cotton Mills furnished at short notice.

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Lap welded Wrought Iron Tubes

FOR TUBULAR BOILERS,

From 1 1-4 to 6 inches diameter, and any length, not exceeding 17 feet.

THESE Tubes are of the same quality and manufacture as those extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER, Patentee,
d26 28 Platt street, New York

Johnson's Improved Shingle Machine.

THE Subscriber having received Letter Patent for an improvement in the Shingle Machine, is now ready to furnish them at short notice, and he would request all those who want a good machine for sawing shingles, to call on him and examine the improvements he has made, as one eighen more shingles can be sawed in the same given time than by any other machine now in use.

Augusta, Maine, Oct. 1, 1847. J. G. JOHNSON.

☞ The above is prepared to execute all orders at the shortest notice and on the most reasonable terms.

GENERAL PATENT AGENCY.

REMOVED.

THE SUBSCRIBER has removed his Patent Agency from 12 Platt to 189 Water street.

The object of this Agency is to enable Inventors to realize something for their inventions, either by the sale of Patent Goods or Patent Rights.

Charges moderate, and no charge will be made until the inventor realizes something from his invention.

Letters Patent will be secured upon moderate terms. Applications can be made to the undersigned personally or by letter post paid.

f8 SAMUEL C. HILLS, Patent Agent.

To Mill Owners.

HAVILAND & TUTTLE'S Patent Centre Vent Pressure Water Wheel.—These wheels are now in successful operation in many towns in Maine, Massachusetts, and Rhode Island, and are found to surpass in power and facility of adaptation any water wheel now in use. This wheel was awarded the silver medal at the Fair of the American Institute recently held in New York and a diploma at the Mechanics' Fair in Boston.

The wheels are manufactured and for sale by the FULTON IRON FOUNDRY CO., South Boston, Mass.,—where the wheels can be seen and any information concerning them had.

Patent Rights for different States, Counties, &c. for sale, as above. m25 6m*

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"Lamp Depot."

Nos. 134 and 136 Fulton st., Sun Building.

J. O. FAY has just received from the manufactory of J. G. Moffett, a full and most splendid assortment of Solar Lamps for Parlors, warranted perfect; unequalled in style and beauty of finish—new patterns. the handsomest ever offered for sale, and the cheapest Lamp Store in New York m25 3m*

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For the Scientific American.

Tempering.

There are some kinds of steel far superior to others, both on account of their toughness and the quality of retaining a fine edge. The blades of Damascus have been famous for ages and all the advancement made in science has not yet produced a superior steel. The Damascus is of a kind of purple and dark streaked color. Some have supposed that it was a portion of alumina along with the carbon and iron, that like the famous *wootz* of Bombay, gave the Oriental blade both its fine qualities and beautiful color. Undoubtedly a portion of alumina along with steel gives the damask color on the application of sulphuric acid, but an alloy of chromium with cast steel, in proportion of one of chromium to 100 of steel also gives a fine damask color. The great beauty of cutting instruments depends upon the forging. A graver for steel engraving of a lozenge shape, will be utterly worthless unless the point has been made out of a part of the lozenge that has been subjected to the hammer At one period it was not possible to get good gravers in this city. The foreign kinds were made for the markets cheap and worthless, and no doubt not one of them, excepting some few good Swiss gravers, were forged out in the most easy and rapid manner. Mr. Nixon, the cutler in the basement of the Sun office in this city, effected a great revolution in gravers, and now not one of the foreign kind is purchased by our engravers. Gravers have to be carefully forged, annealed and condensed by hammering cold and then hardened and tempered.

Steel is composed of a number of crystals and these exhibit like spheres or prisms all the colors of the rainbow. If we look upon bright steel surfaces we will perceive a shading of colors. Silver and tin exhibit the same appearance. This is the chromatic scale faintly exhibited by the minute prominence of the crystals which compose these metals. If we apply heat to these metals, the crystals are thereby rendered more prominent and the colors are better displayed. Thus if we take a polished knife blade and lay it on a plate of warm iron, we will soon perceive that it goes through a change of all the colors and these colors have been taken advantage of to regulate the various degrees of temper of various instruments.

When soft steel is heated cherry red and suddenly plunged in cold water, it is rendered so hard as to resist the file and is very brittle. The tempering of steel consists in reducing this excessive hardness to a moderate degree by a gentle heating, which also restores its toughness and elasticity. In 1789 a patent was obtained for tempering cutting instruments made of steel by immersion in oil heated to a regulated temperature by the thermometer. This invention was a great improvement both in certainty and speed. The common method practised before and still practised by many, was by heating the instruments over a flame or fire till a certain color produced by a film of the oxide appeared on the surface. These colors were indicated at different degrees of heat. A yellow was a hard temper and appeared from heat of 430 degrees to 480. Hard steel polished and heated to 510° appears of a purple color, and at 550° a bright blue. This is the heat for swords and watch springs, and if heated to 600° for pit saws, the metal appears of a blue black and has to be polished of its oxide to look well. If steel be heated more than 600° it becomes very soft. Tools having thick backs and thin edges are tempered by placing their backs on a hot iron plate so that the edge may not be heated more than the back. To prevent the warping of long blades they are hardened by being plunged vertically into water. The metallic bath is now used for tempering many instruments, but the oil bath is not inferior. The different colors on steel can be removed by polishing and thereby blue and bright flowers may be formed on the blade.

[We have been informed (but have not made the experiment) that a polished plate of the finest steel if smeared with soft soap heated to any tempering degree and then plunged in cold water, will retain all its pristine polish.

For the Scientific American.

Browning Gun Barrels.

The browning of gun barrels consists in a process by which the surfaces of the barrels are made into a shining brown color. Rust is the oxide of iron and the browning is just the taking advantage of this quality in iron to rust or oxidise, and converting it from an evil to a good by giving the iron a beautiful color and keeping it from further oxidisation.

The most common method of covering the barrel with a film of oxide, is by rubbing it over with a very weak solution of nitric acid and water and setting them aside for a few days, then taking them out, rubbing them over with a brush made of fine wire. This brush is made like a shaving brush, only the points of the wires are not used, but a number of fine wires are turned or bent up and twisted together, and using that end of the wires which is bent. The gun barrels are well scoured with this, then another rubbing of the weak acid given and the same course pursued as before described. In one or two days the barrels are ready to be brushed for varnishing and finishing. The acid, however, must be completely killed and this is done by pouring boiling water on the barrels. This water is made a little caustic with soda or potash, and must be washed off again with hot water, when the barrels are carefully dried and varnished with a varnish made of 2 ounces of shellac, a few grains of dragon's blood and two quarts of alcohol. This varnish is also used for varnishing gun stocks and it thus answers two purposes. Some instead of using varnish, polish with a steel burnisher, or rub well with a solution of wax and turpentine until the barrel has a shining appearance. The varnishing is the best for standing the weather, which is the great beauty of browning. We have seen some barrels that were beautifully finished, but rusted with the least dampness, either because the acid was not well killed, or because the oxide was not a sufficient protection to the iron.

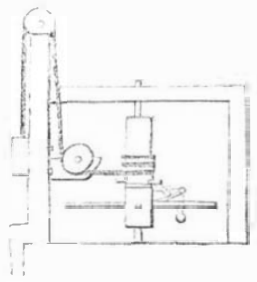
Some use a mixture of the chloride of antimony and olive oil for bronzing iron. The barrel is rubbed over with it, exposed to the air for one day and then rubbed over with a solution of weak aquafortis to quicken the operation, when the barrel is left exposed to the air till the degree of browning desired, is produced, when the same process described above is gone through for finishing.

Another plan is to make up in a quart measure 1 ounce of aquafortis, 1 ounce of alcohol and 3 ounces of blue vitriol and copperas half and half, along with as much water as will fill the measure. This is applied to the barrel with a fine rag or sponge till the whole surface is moist, and the barrel allowed to stand about one day, when the oxide is to be brushed off with a very stiff brush and the same operation repeated two or three times, till the barrel acquires the requisite color.—The gun barrels must all be perfectly free from grease and bright before the browning liquid is applied, or else if there is any grease on any part of the barrel (and there is danger of this from the oil used by the gunsmith,) the browning will be uneven. The barrel therefore should be rubbed first with lime and water to take away the rust and the lime has the effect of making the barrel a beautiful buff color, if it is allowed to stand on the barrel. Some of our gunsmiths may therefore make buff-colored barrels, merely using lime for browning and then varnishing on the top.—When the sulphate of copper is used in a browning solution, the wire brush must not be neglected in rubbing off the scales. Burnished muskets although giving an army a showy appearance, still should not be used—they are troublesome to keep clean and confer no benefit on the soldier. No rifle should be left unbrowned. The streaked appearance in gun barrels is given by browning with a pencil or any other means to make one stroke darker than another, by using a weak solution, or penciling one streak and not the other. The mixture with the sulphate of copper is to give a damask appearance.

For burnished muskets, the electrotyping process for silverizing, as described in the last number of the Scientific American, may be valuable and certainly not very expensive, while it would most effectually prevent all rusting.

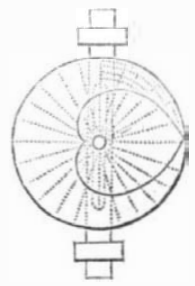
MECHANICAL MOVEMENTS.

Pile Driver.



This is a machine which has often been used for driving piles, in which the circular motion of the central perpendicular shaft is converted into alternate perpendicular motion in the weight on the left. The principal contrivance by which the weight is relieved when at its highest elevation is effected by the progressive increase of the coils of rope on the central shaft which press on a small lever to the right hand, and disengages the upper part of the shaft and allows the weight to run down, the upper part of the shaft being again re-connected as soon as the rope is run off.

Eccentric for an Uniform Traverse.



As eccentrics are used to copy different forms in Mechanical manipulation—so are they also used to produce or communicate different motions to machinery. As the true principles of sculpture and architecture are derived from a study of geometry, so are those of mechanical arrangement. Every mechanic should study the relationship of forms and their properties. The above figure belongs to the epicycloid and will produce that motion in machinery indicated by its title above, as the plane of the cam or revolving circle forms a constant angle with the plane of the fundamental circle. Romer, the Danish philosopher, who discovered the progressive motion of light was the first who proposed this curve for the teeth of wheels and which brought into use bevel gearing.

Benzoin Acid.

The tree which produces Benzoin is a native of the East Indies, particularly of the island of Siam and Sumatra. The juice exudes from incisions, in the form of a thick white balsam. If collected as soon as it has grown somewhat solid, it proves internally white like almond, and hence it is called Benzoe Amygdaloides; if suffered to lie long exposed to the sun and air, it changes more and more to a brownish, and at last to a quite reddish brown color.

This resin is moderately hard and brittle, and yields an agreeable smell when rubbed or warmed. When chewed it impresses a slight sweetness on the palate. It is totally soluble in alcohol; from which, like other resins, it may be precipitated by the addition of water. Its specific gravity is 1,092.

The white opaque fluid thus obtained has been called Lac Virginale; and is still sold, with other fragrant additions, by perfumers, as a cosmetic.

For Weak Ankles and Wrists.

Press round the muscles of the heel with the two thumbs, or more especially, the muscles below the ankle. If an assistant can be had, he can do it better. This operation strengthens the parts and promotes the circulation of the blood in its return to the heart. For the wrist, press and champoo the joint with the fingers.

Photography.

M. Niepce de St. Victor, in making some experiments in photography, finds that if a sheet of paper on which there is writing or printed characters, or a drawing, be exposed for a few minutes to the vapor of iodine, and there be applied immediately afterwards a coating of starch moistened by slightly accidulated water, a faithful tracing of the writing, printing, or tracing will be obtained. M. Niepce has also discovered that a great number of substances, such as nitric acid, phosphoric acid, chlorurets of lime and mercury, &c., act in a similar manner, and that various vapors, particularly those of ammonia have the effect of vivifying the images that are obtained by photography.

Sound Destroyed By Sound.

A tuning fork being struck and held over a glass jar produces one continued sound. Now take two tuning forks of the same note, and after fastening a circular piece of card on one of the prongs of each, put a little sealing wax on one to make it heavier than the other. On striking them both and holding them over the jar, there will be periods of silence, and periods of sound. This arises from the fact that sounds proceed in waves, and the periods above mentioned are according as the longer waves arising from one of the forks, overtakes and interferes with the sherter waves arising from the other.

Tracing Paper.

Mix 6 parts by weight of pure turpentine, 1 part of rosin and 1 part of boiled nut oil and apply it to the paper with a sponge. Then dry and you will have a tracing paper to suit to a bird's eye. Plumbago, a very small quantity mixed with the above composition and applied along with it makes very good paper for manifold letter writers.

Oil of Ben.

This is obtained from the Ben nut by simple pressure. It is remarkable for its not growing rancid in keeping, or at least not untill it has stood for a number of years, and on this account it is used in extracting the aromatic principle of such odoriferous flowers as yield little or no essential oil in distillation.

French Varnish.

Eight gills alcohol, pure; 4 ounces of shellac and 1 ounce of gum sanderac. Put the gum sanderac and the shellac into spirits of wine in a stone bottle and set it past in a moderately warm place, shaking the bottle once or twice every day till all be dissolved.

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